

4.4 Piecewise Functions Notes

Graphing Piecewise-Defined Functions

Sometimes a function is defined differently on different parts of its domain. When functions are defined by more than one equation, they are called *piecewise-defined functions*.

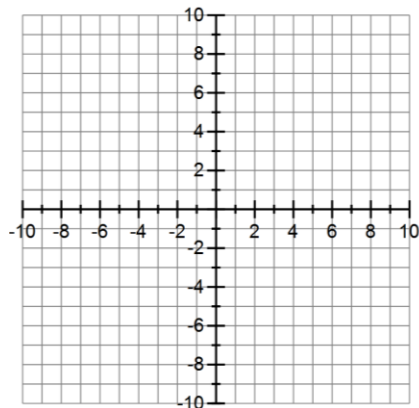
Examples: For the following functions:

a) Graph the function.

c) Locate any intercepts.

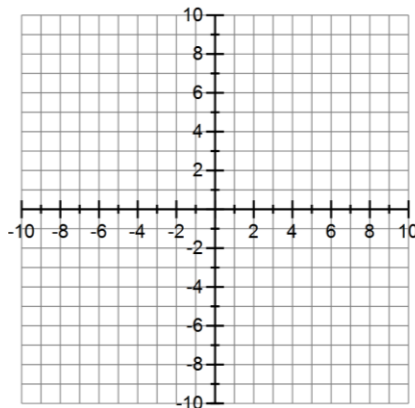
b) Find the domain and range of the function.

$$1) f(x) = \begin{cases} x+3 & \text{if } x \leq -1 \\ 2x & \text{if } x > -1 \end{cases}$$



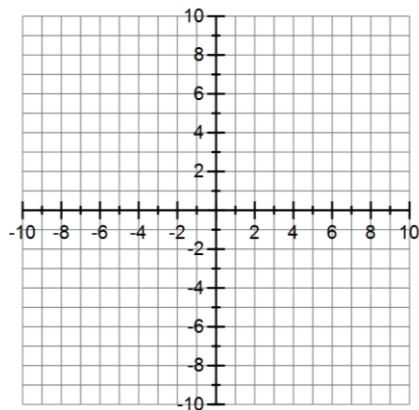
Find: $f(-4)$ $f(0)$ $f(4)$

$$2) f(x) = \begin{cases} 2 & \text{if } -4 < x < 0 \\ x^2 + 2 & \text{if } x \geq 0 \end{cases}$$



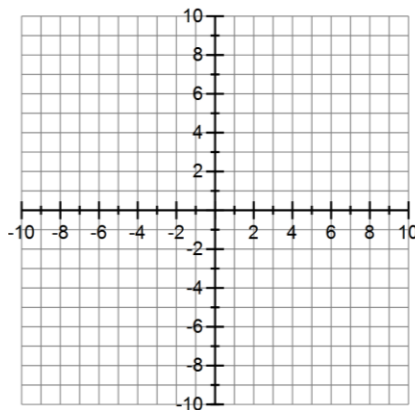
Find: $f(-2)$ $f(0)$ $f(6)$

$$3) f(x) = \begin{cases} 3-x & \text{if } -5 \leq x < -2 \\ \sqrt{x} & \text{if } 0 < x < 4 \\ 2x-6 & \text{if } x \geq 4 \end{cases}$$



Find: $f(-3)$ $f(1)$ $f(8)$

$$4) f(x) = \begin{cases} |x| & \text{if } x < 2 \\ 5 & \text{if } x = 2 \\ -\frac{1}{2}x & \text{if } x > 2 \end{cases}$$



Find: $f(-5)$ $f(2)$ $f(-6)$

Write a definition for each piecewise function.

